GLOBAL CLIMATE COALITION

TESTIMONY OF

THE GLOBAL CLIMATE COALITION

before the

ENERGY AND POWER SUBCOMMITTEE

of the

COMMITTEE ON ENERGY AND COMMERCE

UNITED STATES HOUSE OF REPRESENTATIVES

March 3, 1992

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Mr. Chairman, Members of the Subcommittee:

I am Michael E. Baroody, Senior Vice-President of the National Association of Manufacturers and Chairman of the Board of the Global Climate Coalition. The Global Climate Coalition is a broad-based organization of business trade associations and companies representing virtually all elements of U.S. industry including the energy producing and energy consuming sectors. A list of our members is attached. We are pleased to provide our comments on the implications for the international competitiveness of U.S. industry in setting domestic and international climate change policy.

Mr. Chairman -- I congratulate you for framing the climate change issue in the context of industrial competitiveness. A strong and growing economy and a robust industrial sector are prerequisites to addressing domestic and international environmental challenges. Ill-considered policy responses to issues such as climate change that adversely impact the competitiveness of our nation's industries would ultimately hamstring our ability to respond to other pressing energy and environmental challenges.

With a strong and growing economy, United States industry can continue to develop and produce technologies that will make the U.S. economy more efficient, and through technology cooperation make it possible for developing nations and those with economies in transition to expand their economies in an environmentally sound manner.

The Coalition believes that proposed climate change response strategies must be thoroughly analyzed to assess their competitive impacts on our economy. There is no question that measures to sharply reduce greenhouse gas emissions would impose massive costs on the U.S. economy.

- GNP would fall by over $95 billion a year, according to a study by Charles River Associates. A 1990 Congressional Budget Office study reached similar conclusions.

- 600,000 jobs per year would be lost, according to a recently released Department of Commerce study.
- And the U.S. would suffer economic losses greater than its European and Japanese competitors, according to the same study.

SCIENCE

Science -- not emotional or political reactions -- must serve as the foundation for global climate policy decisions. Rational decision-making requires that we first understand the nature and extent of whatever problems we are trying to address and then formulate our responses based on this understanding. For science to properly provide the basis for critical policy decisions, enhanced scientific research must be the first priority as it is in the United States. Policy decisions made without the benefit of adequate scientific understanding of the complex global change phenomena could have far-reaching and detrimental social and economic impacts.

There is no disagreement over the theory that there is a natural "greenhouse effect" which keeps the Earth warmer than it would otherwise be, and that atmospheric accumulations of several greenhouse gases are increasing. However, there is still substantial uncertainty about the importance of human-induced global warming. While some minor global climate changes have been suggested, it has yet to be determined whether that is a result of natural forces (which account for the overwhelming share of the greenhouse gas concentrations and emissions each year), human activity or a combination of both. While many scientists agree that continued accumulation of greenhouse gases means that some changes in global temperatures and climate are possible, there is substantial uncertainty within the scientific community. The timing, magnitude, rate, and regional impacts -- and, hence, the costs and benefits, of those changes remain unclear. These effects may well be small relative to the range of natural variation.

To remove as much of this kind of uncertainty as possible, the Coalition strongly supports a coordinated international research program. The Coalition also recommends that the U.S. continue its substantial investment in this area (over $1 billion invested in FY 1991, $1.1 billion committed in FY 1992 and $1.4 billion requested in FY 1993) with future research focused on: improving our understanding of the carbon cycle, determining the roles of clouds, oceans, polar ice caps, soil and forests and their interactions; identifying regional impacts of possible climate changes; differentiating between climate change arising from natural causes and changes attributable to manmade emissions; understanding the role of CFC's and their substitutes; understanding the role of solar activity in climate change; and testing and improving "general circulation models" -- the computer models used to predict complex interactions of the

climate system.

While international research proceeds, the Coalition encourages its members to contribute to better scientific understanding both through in-house research and through financial support to others conducting research. The Coalition also supports activities that make economic sense in their own right -- continuing sound business practices that will lead to more efficient use of energy.

INTERNATIONAL CONCERNS

The Coalition supports a comprehensive and international approach to global climate change based on cost-effective, scientifically sound policies that are independently justifiable in their own right. Any action on the global climate change issue must take into account the negotiations of the United Nations Intergovernmental Negotiating Committee for a Framework Convention on Climate Change (INC) and the work of the Intergovernmental Panel on Climate Change (IPCC). Proceeding on a unilateral basis to stabilize or reduce greenhouse gas emissions, in the absence of an enforceable international agreement applicable to all nations, would place U.S. industry at a competitive disadvantage in world markets and could harm our nation's economy.

The Coalition believes that any international agreement dealing with greenhouse gases should (1) be based on sound science (2) be comprehensive, addressing all gases, not just carbon dioxide or any single gas; (3) require that all countries bear their fair share in undertaking climate change policies; and (4) emphasize flexibility in policies to allow countries and private markets the ability to respond as economically and efficiently as possible. In addition, U.S. industry firmly believes that a crucial element not only of any international agreement on global climate change, but also of this country's response to the issue, must be technology cooperation in the international community.

The Coalition believes that any policy designed to deal with greenhouse gases should be scientifically and economically justified and should be undertaken through a multilateral approach. We should emphasize flexibility in our energy, agricultural, foreign assistance, trade and research policies so that we can adjust our programs and our investments as our understanding of the global climate change phenomenon increases and as our multilateral discussions mature.

PROPOSALS OF OTHER COUNTRIES

Although many countries have announced substantial "commitments" to curb carbon dioxide, very few, if any, of the statements have been supported by binding obligations under the laws and regulations of those countries -- as such, these so-called "commitments" are not particularly meaningful. However, any commitments made by the U.S., in the context of a treaty, are binding under implementing laws and regulations that would be vigorously enforced by our regulatory authorities. Many of the lesser developed countries and countries with economies in transition, including China, the Commonwealth of Independent States (CIS) and India, have not made commitments to reduce their emissions of carbon dioxide or greenhouse gases. Because these developing countries have expanding populations, and indigenous fossil fuel resources, and are planning significant economic growth in the future, they will be responsible for a majority of the greenhouse gas emissions growth in the near future. For example, China, with approximately 20 percent of the world's population, plans to double its electricity generation in the next ten years, and about 75 percent of that will be coal-fired. Comparable generation growth will occur in populous India, Africa and Latin America. Many of these countries are calling on the developed countries of the world to bear vastly more than their share of greenhouse gas reductions in order to allow for increases in greenhouse gas emissions in the developing world. Or, unfortunately, many of these countries are using the carbon dioxide issue as a lever to obtain additional development funds from the industrial countries.

Further, several industrialized countries have suggested that policies address only carbon dioxide, and thus ignore methane and other greenhouse gases. To focus solely on carbon dioxide emissions is to ignore up to half of the potential impact of greenhouse gas emissions. Inevitably, this approach would require substantially greater overall costs to control greenhouse gases. As previously stated, the Coalition believes that any international agreement dealing with greenhouse gases should be comprehensive, addressing all gases, not just carbon dioxide or another single gas.

Moreover, even if the other industrialized countries made <u>real</u> commitments to reducing greenhouse gases, their goals may not make sense for the United States. Energy demand in industrialized countries is determined by widely disparate and largely non-energy characteristics: climate, geography, population density, personal incomes, life styles, resource availability, building stocks, transportation systems, industry structure, and so forth. Only a relatively small part of country-to-country differences can be reasonably ascribed to different levels of energy utilization. The international statistics on energy end-uses are too general to adjust for all of these factors. As the International Energy Agency observes, it is "impossible to develop uniform statistical measures [of energy efficiency] for whole economies or even sectors."

The United States requires more energy than many other countries for heating and cooling (our summers and winters are more extreme), and for transportation (our land mass is larger and our population more geographically dispersed). Since 1973, the U.S. has reduced energy usage almost 40% per dollar of GNP.

ARTIFICIAL RESTRICTIONS

Although every national economy would be affected by the imposition of artificial carbon emissions restriction, the effect would vary greatly. The impact on China, and the rest of the nations with emerging economies or nations with economies in transition, would clearly exceed the ability of these fragile economies to cope with this international carbon reduction. China's losses alone from such restrictions would exceed 10 percent of its annual GDP by the latter half of the 21st century.

The effect of artificial carbon restrictions necessary to achieve the stabilization or reduction of greenhouse gas emissions would be devastating on the U.S. economy. A recent study conducted by Charles River Associates and endorsed by the Coalition, found that stabilizing carbon dioxide emissions at 20 percent below current levels would produce annual losses of 1.7 percent of the GNP in 2020, increasing to 2.4 percent in 2100, a loss to the GNP of over $95 billion per year. Another study released by the Department of Energy also concluded that the total cost for capping carbon dioxide at 20 percent below 1990 levels could cost $95 billion a year. In addition, the United States would suffer a significant loss in employment averaging 600,000 per year over a 25-year period.

A recent study by the Department of Commerce indicates that a tax on fossil fuels designed to obtain a 20 percent reduction in emissions of carbon dioxide by the year 2020 would lower output among major OECD nations by 1 to 3 1/2 percent. The United States and other nations that are heavy users of fossil fuels would experience the greatest loss in output (as measured by gross domestic product or gross national product). The study stated that the U.S. economic output would be 3.1 percent lower. By contrast, France, which uses nuclear power for a large amount of its electricity, would have its GDP reduced by only 1.7 percent over the quarter-century.

Our trade competitors know that carbon dioxide stabilization would be disproportionately costly for the United States and would give them increased trade competitive advantage. In order for the U.S. to stabilize its carbon dioxide emissions at current levels by 2000 a tax of $120 per ton of carbon is required; in order to achieve a 10 percent reduction by 2010 a tax of $384 per ton is required; and in order to achieve a 20 percent reduction by 2020 a tax of $720 per ton is required. In the United States a tax per $100 per ton of carbon would

equate to a tax of $70 per short ton of coal, $11 per barrel of oil, $1.66 per MCF of natural gas and $0.27 per gallon of gasoline.

Developed countries and developing countries are economically interdependent. Trade, interest rates, capital flows and commodity prices are the common denominator of this interdependence. The linkage is so intimate that a 1991 World Bank report estimated that a 1 percent per annum change in OECD growth could affect the growth rate of developing countries by an average of 0.7 percent. Lower economic growth rates in industrialized countries could result in a deteriorating balance of trade for developing countries and for countries with economies in transition. The business community emphasizes that an integrated assessment of the possible economic consequences of reduced growth in developed countries on the economies of developing countries and countries in transition is urgently required as a basis for policy decisions.

TECHNOLOGY COOPERATION

The Global Climate Coalition has an active program to address national and international issues and to assist U.S. government activities related to technology cooperation. The Coalition has participated in numerous policy meetings with representatives of Congress and federal agencies such as the Environmental Protection Agency, Department of Commerce, Department of State, Department of Energy, and the Council on Environmental Quality; addressed technology cooperation issues before the INC; and cosponsored a conference with the U.S. Department of Commerce on technology transfer to Eastern Europe.

Even more significantly, U.S. industry has an extensive program of environmental technology programs overseas. Many companies that are members of the Coalition have joint ventures or other mechanisms in which they engage in technology cooperation projects in developing countries and countries with economies in transition. In addition, the U.S. Government is expanding and refocusing its technology and research and development programs to facilitate technology cooperation between the government and private industry to enhance the international competitiveness of U.S. industry.

The Coalition urges the United States to continue its leadership role in such international forums as the INC and IPCC. Technology cooperation has been a major issue through the negotiations of the INC and is expected to be a major issue of the United Nations Conference on Environment and Development (UNCED) in June 1992. In this regard, the Coalition strongly endorses the plan by the Administration to provide a $75 million fund to assist developing nations in reducing their emissions of greenhouse gases. The Coalition is however, concerned that many foreign countries view technology cooperation as a form and means of

obtaining U.S. foreign aid. The INC has stated that the developing countries have requested that the "best available, environmentally sound technologies" be transferred to them on a "most favorable basis" and with the developed countries providing "adequate and additional financial resources" to assure the transfer occurs expeditiously.

Importantly, inadequate protection of intellectual property rights creates substantial barriers to technology transfer technology. Without guaranteed protection for patents, trademarks and copyrights, U.S. companies have a strong disincentive to pursue the costly work of technological and industrial innovation and to transfer that technology overseas. To facilitate technology transfer, the U.S. must demand that foreign governments and firms protect U.S. technology, and property rights and that any transfer occur on a commercial basis.

For the past two decades the U.S. has been at the forefront among the nations of the world on environmental policy and technology development and implementation. This leadership position, combined with private and public research and development capabilities in the U.S. gives us the edge in providing technology, training, operation, maintenance and management assistance to developing countries and economies in transition, including Eastern Europe, as those countries focus on the dual objectives of environmental improvement and economic development.

Specifically, the Federal Government could assist U.S. technology transfer activities by:

1) Helping countries prepare accurate and detailed needs assessments.

2) Providing additional analysis and information on environmental technology needs and market opportunities to U.S. business through the embassy and consulate staff as well as through the Commerce Department's International Trade Administration staffs.

3) Identifying and eliminating impediments to technology transfer.

4) Facilitating the entry and acceptance of new technologies where appropriate.

5) Promoting U.S. businesses as sources of environmental technology to meet the needs to developing countries and their industries.

6) Supporting research, development, demonstration and commercialization programs.

Finally the U.S. Government should work with U.S., regional and international financing and economic development agencies to provide information on U.S. environmental technology capabilities and assist U.S. technology suppliers to meet the environmental needs identified in the national reports.

CONCLUSION

The Coalition believes that any policy response to the climate change issue must take into account impacts on industrial competitiveness. Ill-considered policy responses to issues such as climate change that adversely impact the competitiveness of our nation's industries would ultimately hamstring our ability to respond to other pressing energy and environmental challenges. The Coalition believes that science -- not emotional or political reactions -- must serve as the foundation for global climate policy decisions. The Coalition supports a comprehensive and international approach to global climate change based on cost-effective, scientifically sound policies that are independently justifiable in their own right. Through a strong program of technology cooperation the U.S. can assist developing nations and those with economies in transition to expand their economies in an environmentally sound manner.

GLOBAL CLIMATE COALITION

GLOBAL CLIMATE CHANGE AND SCIENTIFIC UNCERTAINTY

INTRODUCTION

The Global Climate Coalition ("the Coalition"), an ad hoc association of U.S. business trade associations and private companies, is actively involved in the debate over global climate issues because of the concern which its members share over the issues, and the potentially enormous impact which improper resolution of those issues may have on our industrial base, our customers and their lifestyles, and on the national economy.

An underlying principle for addressing global climate change issues is that science must serve as the foundation for global climate policy decisions. Policy decisions should be based on adequate understanding of the complex global change phenomenon, as such decisions will have far-reaching social and economic impacts. Strategies that provoke serious economic, social, environmental, or political dislocations could affect worldwide developments as profoundly as any potential climate change.

To enable science to provide a basis for critical policy decisions, a well-focused scientific research must be a high priority. Insofar as the science is concerned, the Coalition agrees with the observation of Working Group I of the Intergovernmental Panel on Climate Change ("IPCC"):

> "To reduce the current scientific uncertainties...will require internationally coordinated research, the goal of which is to improve our capability to observe, model and understand the global climate system. Such a program of research will reduce the scientific uncertainties and assist in the formulation of sound national and international response strategies."

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While some warming may occur, the Coalition believes that the current state of knowledge does not justify predictions of substantial warming and accompanying adverse environmental impacts in the next century. Indeed, the key factors affecting potential global climate change are beset by scientific uncertainties, such as:

1) The extent and effects of natural (as opposed to man-induced) climate variability.
2) What part of any global climate change that is occurring is related to greenhouse gas emissions, as opposed to other man-induced changes (e.g., land use).
3) The emissions, sources and contribution to radiative forcing of different greenhouse gases.
4) The accuracy and reliability of current climate models.
5) The possible effects of climate change on humans and the environment.
6) The effect of changing levels of atmospheric particles and aerosols.
7) The costs and benefits of adaptative and mitigative actions to address possible global climate change.

UNCERTAINTIES

Historic Trends In Climate And Climate-Related Parameters

An important element in improving our understanding of climate change and the potential for climate alteration by man is determining how climate has changed in the past and the underlying causes for these changes. It is instructive to examine historical records of climate and climate-related parameters.

A number of studies have compiled and evaluated atmospheric temperature records from around the world and concluded that the global average surface atmospheric temperature has risen about 0.5 degrees C (one degree F) over the past 100 years. However, significant biases associated with measurement methods and spatial distribution of measurement sites exist in these data and the 100-year global atmospheric temperature record is not amenable to conclusions regarding statistical trends, or causality of any observed changes. For the United States, analysis of surface atmospheric temperature records demonstrates no temperature trend over the past 100 years if the urban heat island effect has been accounted for. Furthermore, satellite measurements, which have been made over the past dozen years or so, show no global temperature trend and are in disagreement with land surface measurements during that time period.

Since oceans cover more than 60% of the surface area of the Northern Hemisphere and over 80% of the surface area of the Southern Hemisphere, any attempt to compile global temperature variations must include ocean temperatures. Yet, sea surface temperature observations have been sporadic and measurement techniques have changed significantly. Therefore, the global representativeness of the sea surface temperature data bases is problematic.

Deep ice cores collected in Greenland and Antarctica have been used to infer long-term average atmospheric temperatures dating back thousands of years, but substantial questions exist regarding their use. The analyses of ice core temperatures represent very long-term averages, and they are unreliable indicators for very recent history. Also, it has not been determined how representative the few cores are of overall global conditions.

With regard to sea level, actual measurements over the past century (through detailed analyses of tide gauge records) have been influenced by vertical land movements, atmospheric pressure, winds, ocean currents, lunar cycles, and the density of sea water. Therefore, there is no defensible evidence of overall sea level change worldwide. While very simple models predict that sea level rise from global warming will occur, some more complex model simulations suggest that precipitation in Antarctica and Greenland may increase, which would initially increase the amount of glacial ice and slightly reduce freshwater influx to the oceans.

At best, historical data bases may support interpretations that are suggestive of "real" changes. At worst, they will never overcome limitations due to lack of representativeness, inaccuracy, or biases. Still, these data bases, with due consideration of their limitations, may provide important benchmarks against which to evaluate models, for the models need to accurately reproduce historical data if one is to have confidence in the models as predictive tools.

Climate Change Models

Given our imperfect understanding of climate processes, it is not surprising that computer climate modelling is inexact, imprecise and uncertain. Existing computer models (the most highly developed of which are the "general circulation models," or

GCMs) that are used to predict the complex interactions of the climate system are still relatively crude with respect to predicting global trends, and are totally inadequate for predicting regional trends. As Working Group I of the IPCC explained, "climate models are only as good as our understanding of the processes which they describe, and this is imperfect." Predictions of the timing of climate alteration, as well as its magnitude and regional patterns, are unreliable at present. The GCMs excluded detailed hydrospheric (water in the atmosphere and on the Earth surface) interactions until very recently and still do not incorporate an active biospheric (plant) component. Thus, widely varied predictions of global average surface temperature increases must be recognized for what they are: uncertain predictions based on incomplete knowledge of complex processes and interactions.

Increasing the complexity of GCMs, to include ocean interaction and cloud formation, has so far tended to reduce the amount of predicted warming. Comparisons among models show large differences in geographic distributions of temperature change, as well as in other climatic parameters such as precipitation.

Environmental Impacts

Increases in atmospheric greenhouse gas concentrations and any resultant climate changes are anticipated to have an impact on global ecosystems. There is large uncertainty in estimating the magnitude, rate, regional distribution and, in some cases, even the direction of change in specific climate variables. Therefore, impact assessments must necessarily assume arbitrary change (i.e., "what if" analyses). Added to this is the difficulty in predicting ecosystem change for any reason due to the many variables that must be considered. Therefore, such assessments must be viewed with caution.

The uncertainties in model calculations have largely been disregarded in assessments of the environmental effects of climate alteration. Given the inability to reliably project regional climate changes, assessing the consequence of these changes on nature and society is problematic. Some scientists forecast that the impact of future climate change may be neutral or beneficial. Recent data indicates that warming may be

manifested through increased nighttime minimum temperatures with no change in daytime maximum temperatures.

Thus, the total production and possible shift in agricultural producing regions for staples such as grain are uncertain -- as is the possible impact on a number of regionally important agricultural products. Certain crops such as rice, wheat, alfalfa and soybeans could benefit from increased atmospheric CO_2, due to an increased rate of photosynthesis and improved water use efficiency. Agriculture may benefit from climate change in some areas, while in others it may be adversely affected. Countries with modern agricultural systems should be able to adapt to climate change while socioeconomic constraints might make adaptation much more difficult for the developing countries.

Management of water supply is and will continue to be a pressing issue in many regions, even without any climate change impacts. For example, irrigation is already stressing aquifers in many parts of the world. However, concerted water supply and management measures may serve to ameliorate both current and future problems.

The Earth's natural terrestrial ecosystems could be affected in numerous ways by climate change. For example, increased CO_2 levels could stimulate growth in certain species; temperature and precipitation changes could create conditions beneficial or detrimental to certain species; the make-up of plant communities and future changes of those communities could be altered; breakdown of organic matter by microorganisms could increase; and increased drought, precipitation and nutrient stresses could affect plant growth. Climate change could also include an increase in the frequency of extreme weather events and an altered disturbance regime (e.g., wild fires and winds), although no evidence currently exists to support these changes. These could have greater effects on natural ecosystems than any changes in mean climatic conditions.

It has been predicted that an increasing global temperature would cause thermal expansion of the oceans and could reduce the size of the polar ice caps, with a rise in sea level that would flood some coastal regions. However, it is unclear how the polar ice caps will change in response to the counteracting effects of increased temperature

and increased precipitation and, in fact, some scientists predict increased polar ice cap size as a result of climate change.

Perhaps the major uncertainty with regard to oceans is the effect that climate change may have on ocean currents. Some scientists are concerned that the oceanic system could be altered enough to cause significant changes in regional weather conditions. An increase in ocean temperature could alter the CO_2 balance between the ocean and atmosphere. However, there is so little known about how oceans would react to climate change that no reliable conjecture can be made without acquiring massive additional data.

Adaptation

Historical records indicate that the Earth's climate has always been highly variable and that mankind and natural ecosystems have adapted to past climate changes and anomalies. Mankind will need to continue to adapt to future climate anomalies -- periodic droughts, floods, hurricanes, tornadoes, and other weather and climate conditions that cause considerable economic damage and human suffering worldwide. Developed nations are more insulated from these effects than others due to the resiliency of their economies, the nature of their land- and water-use practices, and their technological capabilities. The National Academy of Sciences has stated that the people of the U.S. will likely have no more difficulty adapting to future change than to the most severe conditions in the past. The advent of energy-efficient building designs, air conditioning systems, and improved irrigation and water resource plans will diminish the effects. Poor countries or those with fewer climate zones may have more difficulty. For example, Hurricane Hugo caused relatively minor damage and loss of life several years ago in the U.S., compared to a recent typhoon in Bangladesh that resulted in the loss of 120,000 lives. Strategies to address current climate and weather anomalies can have quantifiable benefits today and provide insurance against future climate change, whether natural or man-induced.

Programs to insulate economies and societies from potential harmful effects of climate anomalies could: 1) improve and implement agricultural practices; 2) improve and implement breeding programs to develop plants adapted to altered climatic conditions;

3) improve and implement forest management and grassland practices; 4) improve and implement water resource utilization and planning; 5) manage marine and coastal environments (e.g., dikes); and 6) upgrade design criteria and safety margins in long-lived structures and infrastructure systems.

CONCLUSIONS

Global climate change is a potentially serious issue that must be addressed comprehensively and equitably by all nations. However, existing scientific evidence does not support unilateral actions aimed solely at stabilizing or reducing greenhouse gas emissions. The Coalition does support mandated actions to reduce greenhouse gas emissions or to increase greenhouse gas sinks that are not justified for other economic or environmental reasons.

The Global Climate Coalition advocates several principles as a reasoned approach to general climate change. Science must serve as the foundation for overall global climate policy decisions, and an enhanced, well-focused scientific research program must be a priority. Even if all of the scientific uncertainties were resolved, sound policy decisions must consider the economic and social impacts of alternative policy choices. The following issues must be addressed: global economic development; new technologies and technology cooperation; costs of various actions; and benefits of different policies. At present, the U.S. research program strongly emphasizes the natural and earth sciences, with a minimal incorporation of research on social and economic impacts.

To remove as much uncertainty as possible the Coalition strongly supports a coordinated international research program. The U.S. government has already taken a substantial step in this direction, with more than $1 billion a year appropriated for global climate research. The development and integration of an international assessment framework would be an important next step that would ensure that the substantial investment in research pays off in well-grounded policy decisions. The Coalition urges the United States to continue its leadership role in such international forums as the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change and the Intergovernmental Panel on Climate Change.